1:Spier E-5 (1918) 1928
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342 [177] The log house built in imitation of the Navaho is a polygonal structure of horizontally laid logs (Fig. 33). The roof is formed of lesser beams which are laid so that each consecutive tier cuts the angles formed by that below, thus drawing the walls into a very flat dome. This is covered with brush and dirt. Such houses are about 5 m. in diameter and about 2.5 m. high.

The second native type is simply the common rectangular flat-roofed shade which has been walled in (Fig. 34). The shade is built on four heavy forked posts (25 cm. in diameter) set in the corners of a square, about 3 m. on a side. Posts are also commonly set at the midpoints of two sides, and sometimes a third row of three is set down the center of the house. In setting such a post, dry sand is poured into the hole in which it stands, the pole is shifted up and down until the sand settles compactly about it, then the hole is filled with damp dirt, which is rammed home. Rafters (15 cm. diameter) lie in the forks of corresponding pairs or trios, about 2.5 m. from the ground. Poles are laid close together transversely on these rafters (or on an intermediate set), on which brush and then dirt is spread. This completes the shade as found in most camps, but if a house is desired three or four thatched walls are added (Fig. 35). Poles are set vertically into the earth along the sides about 30 cm. apart. Light poles are tied horizontally at about the same interval outside of these. This frame is then thatched in the ordinary fashion with long willow brush. Two or three poles are tied horizontally over the thatch to hold it in place. Soapweed leaves are usually used for tying all poles and thatch.

The dirt floor of houses is never treated in any way. In fact, the sand is generally thrown back from the center of the house against the walls in the course of time, so that the structure appears to cover a slight excavation.

[462] Practically all the work of house or shade building is done by men. At least, they perform all the heavy labor of cutting and setting posts and beams. Thatching and covering with earth are done by both men and women. There are no prayers or offerings made when building.

354 The interior arrangement of the dome-shaped house, the type most in use, is not rigidly prescribed. The fireplace (*otúwu*) should be in the center, i.e., not necessarily under the smoke vent. This consists of a slight depression, in which three stones are placed to support a vessel.
352 Beds were usually on the side opposite the entrance. These were slight hollows in which cedarbark mats and rabbitskin blankets are placed.
513 Beds are often located with the head to the east, for in this position the

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sleeper is free from troublesome dreams, will sleep soundly, and arise refreshed. The head of the house or a guest would sleep anywhere he chose. A man's personal belongings were hung over his bed. Food, baskets, etc., were placed nearer the entrance; the food furthest from it to guard against animals. If the house was high enough, a pole on which to hang blankets and skins, was fastened across above man height, but ordinarily this was placed at one side. Cooking is usually done outside.

Every camp has one or more shades which shelter the common domestic activities, and in some instances serve in lieu of a summer house. The shades are built in a great variety of forms; some, in fact, are quite amorphous. The commonest is the rectangular flat-roofed type described above: others are simply a slanting roof, like half a gable, a quarter sphere, like half a dome-shaped house, a barrel vault, and so on. Most are carelessly covered with brush, with dirt banked against them. Ladders (two poles with rungs tied on) are often provided to reach the roof of a house or shade in order to replace the dirt covering, store corn, etc. These are sometimes logs notched on one face. A cooking shelter may be made of boughs set up in a semicircle before the outdoor fireplace, forming a breast-high screen.

There are a series of small caves and rock-shelters (*oyâ''â*) along the cliffs at the top of the talus slope which were used during inclement weather, particularly in the spring, during floods, and the uncertain period when raids were frequent, for they were conveniently located for escape up the cliffs when the alarm was given. A breast-high wall of rocks, laid dry, was built across the opening. Poles were set vertically in the space above the wall, others were tied horizontally across these, and the frame was thatched. A blanket partly covered the entrance, the open space above it providing a smoke vent.

A little ring of brush is raised for a temporary camp. This serves at least to keep out animals and the blowing sand. The White Mountain Apache have a similar usage.

Innumerable storage houses line the ledges at the foot of the cliff all along the canyon, standing high above the reach of floods. A stone wall is built about the mouth of a natural enlargement in a crevice to form a little house of a capacity of 3 to 5.5 cu. m. (Fig. 38). The wall is carefully chinked and plastered with a hard mortar to render it rodent proof. This is made of guano, found in the crevices of the cliff, mixed with dirt. A flat stone is set in the little entrance and sealed with mortar

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fist are spread over this to a depth of about five inches. A fire is then built and allowed to burn until the wood is nearly consumed and the stones are red hot. Several men pound on the pile to reduce it to about ten inches below the surface of the ground. The women have the mescal piled around the pit conveniently at hand. The pit is divided in sections among several families; when the mescal is put in it, some plants are placed on edge to mark these divisions; the others are packed in betweeen. The mescal is covered with grass, canvas, or gunny sacks—and over the top a layer of wet sand is thrown. Forty-eight hours is the usual time required for roasting mescal. Occasionally some of it is dried and ground into a meal from which several dishes are prepared. 252

The fruit of the prickly pear cactus ripens in September and is gathered in great quantities. The fruit is broken off with tongs, rolled in the sand with a brush of twigs, and finally rubbed with a piece of cloth to remove the spines completely. Basketsful are carried home, the fruits opened and spread on arrow-weed mats to dry in the sun. 222 [251]

The fruit of the yucca ripens in September and is found in abundance on the land above the canyon. A layer of this is arranged on a bed of dry sticks, about three feet in diameter. The sticks are fired until the rind of the fruit is burned black, then it is removed, thrown into a pile, and sprinkled with water. The burned rind is removed and the seeds separated from the pulp. The pulp is spread to dry on a layer of grass or Mormon Tea sprigs. The dried yucca sheet is folded and stored. Pieces are broken off and eaten dry or they may be cooked. 222 252

The Havasupai women take pride in their hair, washing it weekly in a yucca suds—a soap substitute made from the roots of the narrow leaved yucca pounded into a pulpy mass and dried. After being thus washed, the hair is soft and glossy. 515 524

The Havasupi house *(hawa)* cannot be classed as either a wickiup or *hogan*. Some are built of willow brush, conical shaped like a tepee; others are constructed like a tent with horizontal ridge pole at the top and a few are built with straight brush walls and a flat roof covered with dirt and thatch. Floors are of dirt and are not treated in any way. The loose sand and trash that accumulates is swept back from the center of the house against the walls and after a time the structure appears to cover a slight depression. Saddles, hides, and other possessions are pushed into corners. Many of the belongings are stored in paper cartons and lug boxes. The cooking is done on a wood burning stove or open fireplace in the middle of the floor, the smoke escaping through a hole in the roof. Living in their remote canyon where everything has to be packed in on horses over a steep winding trail, the Havasupai have few modern household goods. 342 [354] [352] [354]

At night, blankets or small thin mattresses are spread on the ground to provide beds. In the morning, all the bedding is rolled like a cowboy's bed roll and piled along the wall. A few families own modern beds, but the ground is generally used. Beds are usually placed with the head to the east; in this position the sleeper will be free from troublesome dreams, will rest well, and arise refreshed. 513 [17]

Some years ago the government built for the Havasupai a number of two-room frame cottages, but the Havasupai would not give up their old ways. They stored their farm tools, melons, squash, and other supplies in the frame houses and continued to live in thatched houses close by. Today most of these houses are occupied by the Indians at least a part of the year, but some claim the government built houses are too hot in summer and too cold in winter. 177 342 648

The construction of these houses probably has had something to do with the diminishing custom of storing surplus food supplies in cavities in the rock high up on the canyon wall. In olden times each family had its own storage chamber which was sealed up with rocks and mud 343 423